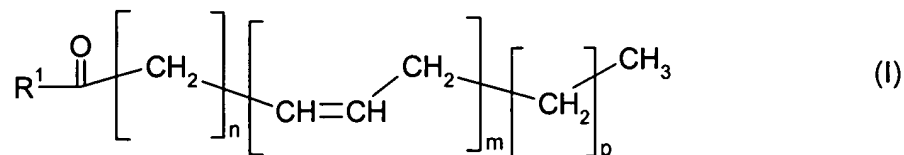


### AMENDMENTS TO THE CLAIMS

1. (Currently amended) A process for the production of compounds of the formula I

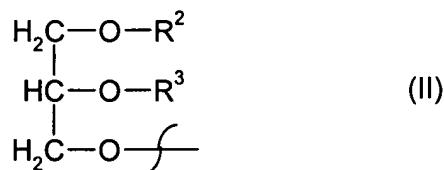


in a transgenic ~~organisms~~ organism with a content of at least 1% by weight of these compounds based on the total lipid content of the transgenic organism, which comprises the following process steps:

- a) introducing, into the organism, at least one nucleic acid sequence which encodes a polypeptide with  $\Delta 9$ -elongase or a  $\Delta 6$ -desaturase activity, and
- b) introducing, into the organism, at least one nucleic acid sequence which encodes a polypeptide with  $\Delta 8$ -desaturase or a  $\Delta 6$ -elongase activity, and
- c) introducing, into the organism, at least one nucleic acid sequence which encodes a polypeptide with  $\Delta 5$ -desaturase activity, and
- d) introducing, into the organism, at least one nucleic acid sequence which encodes a polypeptide with  $\Delta 5$ -elongase activity, and
- e) introducing, into the organism, at least one nucleic acid sequence which encodes a polypeptide with  $\Delta 4$ -desaturase activity, and

where the variables and substituents in formula I have the following meanings:

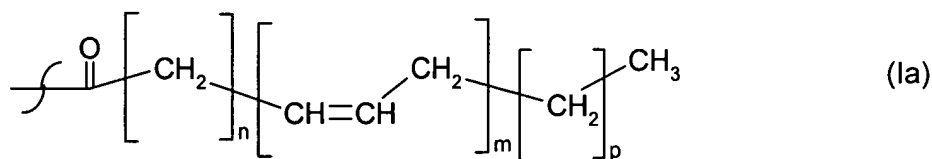
$\text{R}^1 =$  hydroxyl, coenzyme A (thioester), lysophosphatidylcholine, lysophosphatidylethanolamine, lysophosphatidylglycerol, lysodiphosphatidylglycerol, lysophosphatidylserine, lysophosphatidylinositol, sphingo base or a radical of the formula II



in which

$\text{R}^2$  = hydrogen, lysophosphatidyl choline, lysophosphatidylethanolamine, lysophosphatidylglycerol, lysodiphosphatidylglycerol, lysophosphatidylserine, lysophosphatidylinositol or saturated or unsaturated  $\text{C}_2$ - $\text{C}_{24}$ -alkylcarbonyl,

$\text{R}^3$  = hydrogen, saturated or unsaturated  $\text{C}_2$ - $\text{C}_{24}$ -alkylcarbonyl, or  $\text{R}^2$  and  $\text{R}^3$  independently of one another are a radical of the formula Ia:



in which

$n = 2, 3, 4, 5, 6, 7$  or  $9$ ,  $m = 2, 3, 4, 5$  or  $6$  and  $p = 0$  or  $3$ .

2. (Original) The process according to claim 1, wherein the nucleic acid sequences which encode polypeptides with  $\Delta 9$ -elongase,  $\Delta 6$ -desaturase,  $\Delta 8$ -desaturase,  $\Delta 6$ -elongase,  $\Delta 5$ -desaturase,  $\Delta 5$ -elongase or  $\Delta 4$ -desaturase activity are selected from the group consisting of:

a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, SEQ ID NO: 15, SEQ ID NO: 17, SEQ ID NO: 19, SEQ ID NO: 21, SEQ ID NO: 23, SEQ ID NO: 25, SEQ ID NO: 27, SEQ ID NO: 29, SEQ ID NO: 31, SEQ ID NO: 33, SEQ ID NO: 35, SEQ ID NO: 37, SEQ ID NO: 39, SEQ ID NO: 41, SEQ ID NO: 43, SEQ ID NO: 45, SEQ ID NO: 47, SEQ ID NO: 49, SEQ ID NO: 51, SEQ ID NO: 53, SEQ ID NO: 59, SEQ ID NO: 61, SEQ ID NO: 63, SEQ ID NO: 65,

SEQ ID NO: 67, SEQ ID NO: 69, SEQ ID NO: 71, SEQ ID NO: 73, SEQ ID NO: 75,  
SEQ ID NO: 77, SEQ ID NO: 79, SEQ ID NO: 81, SEQ ID NO: 83, SEQ ID NO: 85,  
SEQ ID NO: 89, SEQ ID NO: 91, SEQ ID NO: 93, SEQ ID NO: 95, SEQ ID NO: 97,  
SEQ ID NO: 99, SEQ ID NO: 101, SEQ ID NO: 103, SEQ ID NO: 111, SEQ ID NO: 113,  
SEQ ID NO: 117, SEQ ID NO: 119, SEQ ID NO: 131, SEQ ID NO: 133, SEQ ID NO: 135,  
SEQ ID NO: 137 or SEQ ID NO: 183, or

b) nucleic acid sequences which, as the result of the degeneracy of the genetic code,  
can be derived from the amino acid sequences shown in SEQ ID NO: 2, SEQ ID NO: 4,  
SEQ ID NO: 6, SEQ ID NO: 8, SEQ ID NO: 10, SEQ ID NO: 12, SEQ ID NO: 14,  
SEQ ID NO: 16, SEQ ID NO: 18, SEQ ID NO: 20, SEQ ID NO: 22, SEQ ID NO: 24,  
SEQ ID NO: 26, SEQ ID NO: 28, SEQ ID NO: 30, SEQ ID NO: 32, SEQ ID NO: 34,  
SEQ ID NO: 36, SEQ ID NO: 38, SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44,  
SEQ ID NO: 46, SEQ ID NO: 48, SEQ ID NO: 50, SEQ ID NO: 52, SEQ ID NO: 54,  
SEQ ID NO: 60, SEQ ID NO: 62, SEQ ID NO: 64, SEQ ID NO: 66, SEQ ID NO: 68,  
SEQ ID NO: 70, SEQ ID NO: 72, SEQ ID NO: 74, SEQ ID NO: 76, SEQ ID NO: 78,  
SEQ ID NO: 80, SEQ ID NO: 82, SEQ ID NO: 84, SEQ ID NO: 86, SEQ ID NO: 88,  
SEQ ID NO: 92, SEQ ID NO: 94, SEQ ID NO: 96, SEQ ID NO: 98, SEQ ID NO: 100,  
SEQ ID NO: 102, SEQ ID NO: 104, SEQ ID NO: 112, SEQ ID NO: 114, SEQ ID NO: 118,  
SEQ ID NO: 120, SEQ ID NO: 132, SEQ ID NO: 134, SEQ ID NO: 136, SEQ ID NO: 138 or  
SEQ ID NO: 184, or

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 1, SEQ ID NO: 3,  
SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13,  
SEQ ID NO: 15, SEQ ID NO: 17, SEQ ID NO: 19, SEQ ID NO: 21, SEQ ID NO: 23,  
SEQ ID NO: 25, SEQ ID NO: 27, SEQ ID NO: 29, SEQ ID NO: 31, SEQ ID NO: 33,  
SEQ ID NO: 35, SEQ ID NO: 37, SEQ ID NO: 39, SEQ ID NO: 41, SEQ ID NO: 43,  
SEQ ID NO: 45, SEQ ID NO: 47, SEQ ID NO: 49, SEQ ID NO: 51, SEQ ID NO: 53,  
SEQ ID NO: 59, SEQ ID NO: 61, SEQ ID NO: 63, SEQ ID NO: 65, SEQ ID NO: 67,  
SEQ ID NO: 69, SEQ ID NO: 71, SEQ ID NO: 73, SEQ ID NO: 75, SEQ ID NO: 77,  
SEQ ID NO: 79, SEQ ID NO: 81, SEQ ID NO: 83, SEQ ID NO: 85, SEQ ID NO: 89,

SEQ ID NO: 91, SEQ ID NO: 93, SEQ ID NO: 95, SEQ ID NO: 97, SEQ ID NO: 99, SEQ ID NO: 101, SEQ ID NO: 103, SEQ ID NO: 111, SEQ ID NO: 113, SEQ ID NO: 117, SEQ ID NO: 119, SEQ ID NO: 131, SEQ ID NO: 133, SEQ ID NO: 135, SEQ ID NO: 137 or SEQ ID NO: 183 which encode polypeptides with at least 40% identity at the amino acid level with SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, SEQ ID NO: 10, SEQ ID NO: 12, SEQ ID NO: 14, SEQ ID NO: 16, SEQ ID NO: 18, SEQ ID NO: 20, SEQ ID NO: 22, SEQ ID NO: 24, SEQ ID NO: 26, SEQ ID NO: 28, SEQ ID NO: 30, SEQ ID NO: 32, SEQ ID NO: 34, SEQ ID NO: 36, SEQ ID NO: 38, SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44, SEQ ID NO: 46, SEQ ID NO: 48, SEQ ID NO: 50, SEQ ID NO: 52, SEQ ID NO: 54, SEQ ID NO: 60, SEQ ID NO: 62, SEQ ID NO: 64, SEQ ID NO: 66, SEQ ID NO: 68, SEQ ID NO: 70, SEQ ID NO: 72, SEQ ID NO: 74, SEQ ID NO: 76, SEQ ID NO: 78, SEQ ID NO: 80, SEQ ID NO: 82, SEQ ID NO: 84, SEQ ID NO: 86, SEQ ID NO: 88, SEQ ID NO: 92, SEQ ID NO: 94, SEQ ID NO: 96, SEQ ID NO: 98, SEQ ID NO: 100, SEQ ID NO: 102, SEQ ID NO: 104, SEQ ID NO: 112, SEQ ID NO: 114, SEQ ID NO: 118, SEQ ID NO: 120, SEQ ID NO: 132, SEQ ID NO: 134, SEQ ID NO: 136, SEQ ID NO: 138 or SEQ ID NO: 184 and which have  $\Delta 9$ -elongase,  $\Delta 6$ -desaturase,  $\Delta 8$ -desaturase,  $\Delta 6$ -elongase,  $\Delta 5$ -desaturase,  $\Delta 5$ -elongase or  $\Delta 4$ -desaturase activity.

3. (Currently amended) The process according to claim 1 ~~or~~ 2, wherein a nucleic acid sequence which encodes polypeptides with  $\omega 3$ -desaturase activity, selected from the group consisting of:

- a. a nucleic acid sequence with the sequence shown in SEQ ID NO: 87 or SEQ ID NO: 105, or
- b. nucleic acid sequences which, as the result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 88 or SEQ ID NO: 106, or
- c. derivatives of the nucleic acid sequence shown in SEQ ID NO: 87 or SEQ ID NO: 105 which encodes polypeptides with at least 60% identity at the amino acid level with SEQ ID NO: 88 or SEQ ID NO: 106 and which have  $\omega 3$ -desaturase activity

is additionally introduced to the organism.

4. (Currently amended) The process according to ~~any of claims 1 to 3~~ claim 1, wherein a nucleic acid sequence which encodes polypeptides with  $\Delta 12$ -desaturase activity, selected from the group consisting of:

a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 107 or SEQ ID NO: 109, or

b) nucleic acid sequences which, as the result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 108 or SEQ ID NO: 110, or

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 107 or SEQ ID NO: 110 which encode polypeptides with at least 60% identity at the amino acid level with SEQ ID NO: 108 or SEQ ID NO: 110 and which have  $\Delta 12$ -desaturase activity

is additionally introduced into the organism.

5. (Currently amended) The process according to ~~any of claims 1 to 4~~ claim 1, wherein the substituents  $R^2$  or  $R^3$  independently of one another are saturated or unsaturated  $C_{18}$ - $C_{22}$ -alkylcarbonyl.

6. (Currently amended) The process according to ~~any of claims 1 to 5~~ claim 1, wherein the substituents  $R^2$  or  $R^3$  independently of one another are unsaturated  $C_{18}$ -,  $C_{20}$ - or  $C_{22}$ -alkyl-carbonyl with at least two double bonds.

7. (Currently amended) The process according to ~~any of claims 1 to 6~~ claim 1, wherein the transgenic organism is a transgenic microorganism or a transgenic plant.

8. (Currently amended) The process according to ~~any of claims 1 to 7~~ claim 1, wherein the transgenic organism is an oil-producing plant, a vegetable plant or an ornamental.

9. (Currently amended) The process according to ~~any of claims 1 to 8~~ claim 1, wherein the transgenic organism is a transgenic plant selected from the group consisting of the plant families:

Adelotheciaceae, Anacardiaceae, Asteraceae, Apiaceae, Betulaceae, Boraginaceae, Brassicaceae, Bromeliaceae, Caricaceae, Cannabaceae, Convolvulaceae, Chenopodiaceae, Crypthecodiniaceae, Cucurbitaceae, Ditrichaceae, Elaeagnaceae, Ericaceae, Euphorbiaceae, Fabaceae, Geraniaceae, Gramineae, Juglandaceae, Lauraceae, Leguminosae, Linaceae ~~or~~ and Prasinophyceae.

10. (Currently amended) The process according to ~~any of claims 1 to 9~~ claim 1, wherein the compounds of the formula I are isolated from the organism in the form of ~~their~~ oils, lipids or free fatty acids.

11. (Currently amended) The process according to ~~any of claims 1 to 10~~ claim 1, wherein the compounds of the formula I are isolated in a concentration of at least 5% by weight based on the total lipid content of the transgenic organism.

12. (Currently amended) ~~The oil~~ Oil, lipid or fatty acid, or a fraction thereof, produced by the process according to ~~any of claims 1 to 11~~ claim 1.

13. (Currently amended) ~~The oil~~ Oil, lipid or fatty acid composition which comprises PUFAs polyunsaturated fatty acids (PUFAs) produced by a the process according to ~~any of claims 1 to 11~~ claim 1 and which is derived from transgenic plants.

14. (Currently amended) A process for the production of oils, lipids or fatty acid compositions ~~by~~ , wherein the process comprises mixing oils, lipids or fatty acids produced by the process according to claim ~~12~~ 1, or oil, lipid or fatty acid compositions comprising polyunsaturated fatty acids (PUFAs) produced by the process according to claim ~~13~~ 1 and derived from transgenic plants with animal oils, lipids or fatty acids.

15. (Currently amended) ~~The use of~~ Feed, foodstuffs, cosmetics or pharmaceuticals comprising oils, lipids or fatty acids produced by the process according to claim ~~12~~ 1, or oils, lipid or fatty acid compositions comprising polyunsaturated fatty acids (PUFAs) produced by the process according to claim ~~13~~ 1 and derived from transgenic plants ~~or oils, lipids or fatty acid compositions produced according to claim 14 in feed, foodstuffs, cosmetics or pharmaceuticals.~~

16. (Currently amended) An isolated nucleic acid sequence which encodes a polypeptide with  $\Delta 5$ -elongase activity and comprises an amino acid sequence selected from the group of an amino acid ~~sequence with the sequence~~ sequences as shown in SEQ ID NO: 115, SEQ ID NO: 116, SEQ ID NO: 139, SEQ ID NO: 140, SEQ ID NO: 141 ~~or~~ and SEQ ID NO: 142.

17. (Original) The isolated nucleic acid sequence according to claim 16, wherein the nucleic acid sequence which encodes a polypeptide with  $\Delta 5$ -elongase activity comprises a combination of the amino acid sequences selected from the group consisting of:

a) SEQ ID NO: 115 and SEQ ID NO: 139, SEQ ID NO: 115 and SEQ ID NO: 140 or SEQ ID NO: 139 and SEQ ID NO: 140; or

b) SEQ ID NO: 116 and SEQ ID NO: 141, SEQ ID NO: 116 and SEQ ID NO: 142 or SEQ ID NO: 141 and SEQ ID NO: 142; or

c) SEQ ID NO: 115, SEQ ID NO: 139 and SEQ ID NO: 140 or SEQ ID NO: 116, SEQ ID NO: 141 and SEQ ID NO: 142.

18. (Currently amended) The isolated nucleic acid sequence according to claim 16 ~~or~~ 17 which encodes a polypeptide with  $\Delta 5$ -elongase activity, wherein the nucleic acid sequence is selected from the group consisting of:

a. a nucleic acid sequence with the sequence shown in SEQ ID NO: 43, SEQ ID NO: 45, SEQ ID NO: 47, SEQ ID NO: 49, SEQ ID NO: 59, SEQ ID NO: 61, SEQ ID NO: 63, SEQ ID NO: 65, SEQ ID NO: 67, SEQ ID NO: 75, SEQ ID NO: 77, SEQ ID NO: 79, SEQ ID NO: 83, SEQ ID NO: 85, SEQ ID NO: 113, SEQ ID NO: 131 or SEQ ID NO: 133,

b. nucleic acid sequences which, as the result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 44, SEQ ID NO: 46, SEQ ID NO: 48, SEQ ID NO: 50, SEQ ID NO: 60, SEQ ID NO: 62, SEQ ID NO: 64, SEQ ID NO: 66, SEQ ID NO: 68, SEQ ID NO: 76, SEQ ID NO: 78, SEQ ID NO: 80, SEQ ID NO: 84, SEQ ID NO: 86, SEQ ID NO: 114, SEQ ID NO: 132 or SEQ ID NO: 134, or

c. derivatives of the nucleic acid sequence shown in SEQ ID NO: 43, SEQ ID NO: 45, SEQ ID NO: 47, SEQ ID NO: 49, SEQ ID NO: 59, SEQ ID NO: 61, SEQ ID NO: 63, SEQ ID NO: 65, SEQ ID NO: 67, SEQ ID NO: 75, SEQ ID NO: 77, SEQ ID NO: 79, SEQ ID NO: 83, SEQ ID NO: 85, SEQ ID NO: 113, SEQ ID NO: 131 or SEQ ID NO: 133 which encode polypeptides with at least 40% homology at the amino acid level with SEQ ID NO: 44, SEQ ID NO: 46, SEQ ID NO: 48, SEQ ID NO: 50, SEQ ID NO: 60, SEQ ID NO: 62, SEQ ID NO: 64, SEQ ID NO: 66, SEQ ID NO: 68, SEQ ID NO: 76, SEQ ID NO: 78, SEQ ID NO: 80, SEQ ID NO: 84, SEQ ID NO: 86, SEQ ID NO: 114, SEQ ID NO: 132 or SEQ ID NO: 134 and which have  $\Delta 5$ -elongase activity.

19. (Original) An isolated nucleic acid sequence which encodes a polypeptide with  $\Delta 6$ -elongase activity selected from the group consisting of:

a. a nucleic acid sequence with the sequence shown in SEQ ID NO: 69, SEQ ID NO: 81, SEQ ID NO: 111 or SEQ ID NO: 183,

b. nucleic acid sequences which, as a result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 70, SEQ ID NO: 82, SEQ ID NO: 112 or SEQ ID NO: 184, or

c. derivatives of the nucleic acid sequence shown in SEQ ID NO: 69, SEQ ID NO: 81, SEQ ID NO: 111 or SEQ ID NO: 183 which encode polypeptides with at least 40% homology at the amino acid level with SEQ ID NO: 70, SEQ ID NO: 82, SEQ ID NO: 112 or SEQ ID NO: 184 and which have  $\Delta 6$ -elongase activity.

20. (Original) An isolated nucleic acid sequence which encodes a polypeptide with  $\omega 3$ -desaturase activity, selected from the group consisting of:

a. a nucleic acid sequence with the sequence shown in SEQ ID NO: 87 or SEQ ID NO: 105,



b. nucleic acid sequences which, as a result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 88 or SEQ ID NO: 106, or

c. derivatives of the nucleic acid sequence shown in SEQ ID NO: 87 or SEQ ID NO: 105 which have polypeptides with at least 60% identity at the amino acid level with SEQ ID NO: 88 or SEQ ID NO: 106 and which have  $\omega$ 3-desaturase activity.

21. (Original) An isolated nucleic acid sequence which encodes a polypeptide with  $\Delta$ 6-desaturase activity, selected from the group consisting of:

a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 89 or in SEQ ID NO: 97,

b) nucleic acid sequences which, as the result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 90 or in SEQ ID NO: 98, or

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 89 or in SEQ ID NO: 97 which encode polypeptides with at least 40% homology at the amino acid level with SEQ ID NO: 90 or in SEQ ID NO: 98 and which have  $\Delta$ 6-desaturase activity.

22. (Original) An isolated nucleic acid sequence which encodes a polypeptide with  $\Delta$ 5-desaturase activity, selected from the group consisting of:

a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 91, SEQ ID NO: 93, SEQ ID NO: 99 or in SEQ ID NO: 101,

b) nucleic acid sequences which, as the result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 92, SEQ ID NO: 94, SEQ ID NO: 100, or in SEQ ID NO: 102, or

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 91, SEQ ID NO: 93, SEQ ID NO: 99 or in SEQ ID NO: 101 which encode polypeptides with at least

40% homology at the amino acid level with SEQ ID NO: 92, SEQ ID NO: 94, SEQ ID NO: 100, or in SEQ ID NO: 102 and which have  $\Delta 5$ -desaturase activity.

23. (Original) An isolated nucleic acid sequence which encodes a polypeptide with  $\Delta 4$ -desaturase activity, selected from the group consisting of:

a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 95 or in SEQ ID NO: 103,

b) nucleic acid sequences which, as the result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 96 or in SEQ ID NO: 104, or

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 95 or in SEQ ID NO: 103 which encode polypeptides with at least 40% homology at the amino acid level with SEQ ID NO: 96 or in SEQ ID NO: 104 and which have  $\Delta 4$ -desaturase activity.

24. (Original) An isolated nucleic acid sequence which encodes a polypeptide with  $\Delta 12$ -desaturase activity, selected from the group consisting of:

a) a nucleic acid sequence with the sequence shown in SEQ ID NO: 107 or in SEQ ID NO: 109, or

b) nucleic acid sequences which, as the result of the degeneracy of the genetic code, can be derived from the amino acid sequence shown in SEQ ID NO: 108 or in SEQ ID NO: 110, or

c) derivatives of the nucleic acid sequence shown in SEQ ID NO: 107 or in SEQ ID NO: 109 which encode polypeptides with at least 50% identity at the amino acid level with SEQ ID NO: 108 or in SEQ ID NO: 110 and which have  $\Delta 12$ -desaturase activity.

25. (Currently amended) The isolated nucleic acid sequence according to ~~any of claims 16 to 24~~ claim 16, which sequence is derived from an alga, a fungus, a microorganism, a plant or a nonhuman animal.

26. (Currently amended) The isolated nucleic acid sequence according to ~~any of claims 16 to 25~~ claim 16, which sequence is derived from the order Salmoniformes, the diatom genera Thalassiosira or Crypthecodinium or from the family of the Prasinophyceae, Euglenaceae or Pythiaceae.

27. (Currently amended) An amino acid sequence which is encoded by an isolated nucleic acid sequence according to ~~any of claims 16 to 26~~ claim 16.

28. (Currently amended) A gene construct comprising an isolated nucleic acid according to ~~any of claims 16 to 26~~ claim 16, wherein the nucleic acid is linked operably with one or more regulatory signals.

29. (Original) The gene construct according to claim 28, wherein the nucleic acid construct comprises additional biosynthesis genes of the fatty acid or lipid metabolism selected from the group acyl-CoA dehydrogenase(s), acyl-ACP [= acyl carrier protein] desaturase(s), acyl-ACP thioesterase(s), fatty acid acyltransferase(s), acyl-CoA:lysophospholipid acyltransferase(s), fatty acid synthase(s), fatty acid hydroxylase(s), acetyl-coenzyme A carboxylase(s), acyl-coenzyme A oxidase(s), fatty acid desaturase(s), fatty acid acetylenases, lipoxygenases, triacylglycerol lipases, allenoxide synthases, hydroperoxide lyases or fatty acid elongase(s).

30. (Currently amended) The gene construct according to claim 28 ~~or 29~~, wherein the nucleic acid construct comprises additional biosynthesis genes of the fatty acid or lipid metabolism selected from the group  $\Delta 4$ -desaturase,  $\Delta 5$ -desaturase,  $\Delta 6$ -desaturase,  $\Delta 8$ -desaturase,  $\Delta 9$ -desaturase,  $\Delta 12$ -desaturase,  $\Delta 6$ -elongase or  $\Delta 9$ -elongase.

31. (Currently amended) A vector comprising a the nucleic acid according to ~~any of claims 16 to 26 or a gene construct according to any of claims 28 to 30~~ claim 16.

32. (Currently amended) A transgenic nonhuman organism[[,]] comprising at least one nucleic acid according to ~~any of claims 16 to 26, a gene construct according to any of claims 28 to 30 or a vector according to claim 31~~ claim 16.

33. (Original) The transgenic nonhuman organism according to claim 32, which organism is a microorganism, a nonhuman animal or a plant.

34. (Currently amended) The transgenic nonhuman organism according to claim 32 ~~or 33~~, which organism is a plant.